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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,476	06/24/2003	Nagesh R. Basavanhally	Basavanhally 31-3	2680
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MENDELSON, DRUCKER, & ASSOCIATES, P.C. 1500 JOHN F. KENNEDY BLVD., SUITE 405 PHILADELPHIA, PA 19102			EXAMINER CHIEM, DINH D	
			ART UNIT 2883	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/602,476	Applicant(s) BASAVANHALLY ET AL.	
	Examiner ERIN D. CHIEM	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,11,12,15-18,22,23 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,11,12,15-18,22,23 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the after final amendment filed on May 5, 2010 and petitions filed on May 5, 2010. Claims 1, 3-9, 11-12, 15-18, 22-23, and 29 are pending. Both the petition to withdraw finality and the petition to the review the restriction requirement are persuasive and are granted. The finality of the previous office action mailed March 3, 2010 is withdrawn. The restriction requirement in said office action is also withdrawn. Following is a non-final action on the merits of all currently pending claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-4, 6-9, 15-16, 22 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubbers et al. (US Patent 5,353,792, "Lubbers") in view of Crothall (US Patent 6,049,727, "Crothall").

Regarding claims 1 and 29, Lubbers discloses (referencing Fig. 1 and 8) a sensing system comprising: a first sensor mounted onto a side of an optical fiber 9 and optically coupled to said fiber (Fig. 8 element 3), wherein, the first sensor is one of a plurality of sensors (Fig. 8, elements 3 and 4), in which each sensor is optically coupled to the fiber 9; and when interrogated with light 10 coupled into the fiber 9, the first sensor generates an optical response corresponding to a first value of a first physical parameter to provide a measure of the first value; a first optical filter

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20 inserted into the fiber 9, wherein the first filter 20 is adapted to direct light corresponding to the first sensor between the fiber 9 and the first sensor; and an interrogation device 7 optically coupled to the optical fiber 9 (Col. 5, lines 13-24).

However, Lubbers does not explicitly teach the interrogation device comprises:

- A plurality of light sources each adapted to generate light for optically interrogating a respective sensor and the plurality of sensors;
- An optical multiplexer/demultiplexer,
- And a plurality of optical receivers.

Crothall teaches an implantable sensor and system for in vivo measurement and control of fluid constituent levels wherein Crothall discloses the interrogation device (Fig. 1) comprising light source 12 which is made up of a laser diode array which has a plurality of individual laser diodes emitting discrete wavelengths. Moreover, Crothall discloses a Bragg grating coupler 36 may be adapted to be a multiplexer or demultiplexer. As shown in Fig. 7, the coupler 76 is a Bragg grating coupler which functions as a multiplexer and demultiplexer (Col. 15, lines 62-63). Furthermore, the optical signal is demultiplexed into plurality of components which are received by photodiodes ($80_1, 80_2, 80_3 \dots 80_{13}$).

It would have been obvious to one having ordinary skill in the art to recognize the interrogating device disclosed by Crothall would be modifiable in Lubber's invention since both are in the same field of endeavor. This would enable control of and analysis with a large number of wavelengths as taught by Crothall. Further, Crothall discloses the interrogating device in US Patent '727 is motivated by the poor resolution of the narrow spectral bands in known sensors at the time of invention. The invention by Crothall arranges the source and detector pair so that the

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light output from the source interacts with a body fluid before being received by the detector.

The multiplexer and demultiplexer provided in the interrogating device allows the processor to analyze the signal with improved spectral resolution (Col. 5, lines 39-67 and Col. 6, lines 19-29).

Regarding claim 3, the filter 20 shown is aligned with the first sensor and oriented at about 45 degrees with respect to the longitudinal axis of the fiber 9.

Regarding claim 4, Lubbers discloses (Fig. 8) dichroic mirrors 20 are provided one after another for detecting several measurand together (Col. 5, lines 13-19). Dichroic mirrors, also known as dichroic filters, allows a narrow band of light to transmit while reflecting other bands of light. Therefore, the examiner considers Lubbers' disclosure teaches the limitation as recited in claim 4.

Regarding claims 6-8, and 15-16 Lubbers discloses a second optical filter inserted into the fiber 9 wherein: the second sensor 4 is mounted onto the side of the fiber 9 at a location downstream from the location of the first sensor 3. Regarding the limitation "the second filter is adapted to directly light corresponding to the second sensor between the fiber and second sensor" is considered disclosed by Lubbers since the filters 3 and 4 are fully capable of performing the recited function. Regarding claims 7 and 8—*the second sensor generates an optical response corresponding to...*—is not considered patentably distinct from the prior art of Lubbers since Lubbers teaches the structure of the device recited in claims 7-8. Therefore, the prior art of Lubbers would necessary be capable of performing the functions as recited in claims 7-8.

Regarding claim 9, Crothall discloses the light source 74 may be monochromatic (Figs. 1, 6, and 7).

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Regarding claim 22, Lubber discloses the side of an optical fiber is parallel to the longitudinal axis of the fiber (Fig. 8).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lubbers in view of Crothall as applied to claim 4 above, and further in view of Cohen (US 4,730,622, "Cohen").

Lubbers in view of Crothall discloses the invention of claim 4, however, Lubbers in view of Crothall does not disclose the second sensor is mounted at a terminus of the fiber.

Cohen discloses a catheter 10 having plurality of filters (52a-c) and additionally another filter F is mounted at the terminus of the catheter 10. It would have been obvious to one having ordinary skill in the art to recognize the sensor mounted at the distal end of the sensing system would be modifiable to the sensing body in the device disclosed by Lubbers in view of Crothall. One skilled in the art would be motivated to mount a sensor at the distal end of the sensing body provide a pressure sensor as a guidance means or to detect pressure variance in the region.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lubbers in view of Crothall as applied to claim 1 above, and further in view of Millar (US 6,994,695 B1).

Lubbers in view of Crothall discloses the invention of claim 1 and Lubbers also discloses in specific a catheter having an external tube 6 and internal tube 2 enclosed by the external tube 6 wherein the internal tube accommodates the fiber 9. The external tube 6 is a sharp hollow needle, thus the examiner considers the catheter disclosed by Lubbers is "adapted to" be inserted into a blood vessel.

However, Lubbers in view of Crothall does not disclose the first sensor is exposed on an exterior of the external tube.

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Millar discloses a catheter 200 wherein the sensor 204 is exposed through the opening 208 on an exterior of the external tube 202 (See also Col. 5, lines 31-39). It would have been obvious to one having ordinary skills in the art to recognize the exposed sensor on an exterior of the external tube would be modifiable to the catheter disclosed by Lubbers in view of Crothall. One would be motivated to expose the sensor to the fluid thus providing direct contact between the fluid and the sensing body for an accurate pressure reading.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lubbers in view of Crothall as applied to claim 1 above, and further in view of Sherrer et al. (US 6,738,145A1, "Sherrer").

Lubbers in view of Crothall discloses the invention of claim 1, however, Lubbers in view of Crothall does not disclose the specific of the pressure sensor, as recited in claim 12.

Sherrer discloses a pressure sensor portion (Fig. 1) wherein the sensor comprises a substrate 20; a first layer 34 supported on the substrate 20, the first layer having a portion adapted to move with respect to the substrate under influence of the first physical parameter; a second layer 36 supported on and fixed to the substrate, wherein the first and second layers (34 and 36) formed a sealed chamber physically connected and optically coupled to the fiber, wherein: the portion of the first layer and a portion of the second layer form a Fabry-Perot interferometer (FPI) optically coupled to the fiber, which FPI has variable cavity length 40 due to mobility of the portion of the first layer; and when the portion of the first layer is moved, the reflectivity of the FPI changes.

It would have been obvious to one having ordinary skill in the art to recognize pressure sensor disclosed by Sherrer would be modifiable as a distal end sensor in the device disclosed by

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Lubbers in view of Crothall. One would be motivated to utilize the sensor disclosed by Sherrer because it can be easily mounted and aligned onto a distal end of an optical fiber.

Claims 17-18, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubbers in view of Sherrer.

Regarding claim 17, Lubbers discloses an optical arrangement comprising an optical filter 20 inserted into an optical fiber; and an optical device mounted onto a side of the fiber 9 and optically coupled to the fiber 9, wherein the filter 20 is configured to direct light corresponding to the optical device 3 between the fiber and the optical device 3, wherein the optical device is a sensor adapted to measure a value corresponding to a physical parameter.

However, Lubbers does not explicitly disclose the sensor 3 is a Fabry-Perot Interferometer (FPI) sensor as recited in claim 17.

Sherrer discloses a pressure sensor portion (Fig. 1) wherein the sensor comprises a substrate 20; a first layer 34 supported on the substrate 20, the first layer having a portion adapted to move with respect to the substrate under influence of the first physical parameter; a second layer 36 supported on and fixed to the substrate, wherein the first and second layers (34 and 36) formed a sealed chamber physically connected and optically coupled to the fiber, wherein: the portion of the first layer and a portion of the second layer form a Fabry-Perot interferometer (FPI) optically coupled to the fiber, which FPI has variable cavity length 40 due to mobility of the portion of the first layer; and when the portion of the first layer is moved, the reflectivity of the FPI changes.

It would have been obvious to one having ordinary skill in the art to recognize pressure sensor disclosed by Sherrer would be modifiable as a distal end sensor in the device disclosed by

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Lubbers in view of Crothall. One would be motivated to utilize the sensor disclosed by Sherrer because it can be easily mounted and aligned onto a distal end of an optical fiber.

Regarding claim 18, the filter is aligned with the optical sensor 3 and oriented at about 45 degrees with respect to the longitudinal axis of the fiber (Fig. 8).

Regarding claim 23, the side is parallel to the longitudinal axis of the fiber (Fig. 8).

Response to Arguments

.The arguments have been considered, and the references are deemed to meet the claimed limitations as set forth in the rejections above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIN D. CHIEM whose telephone number is (571)272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Robinson can be reached on (571) 272-2319. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Erin D Chiem/
Examiner, Art Unit 2883

/Mark A. Robinson/
Supervisory Patent Examiner
Art Unit 2883